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97

EFFECTS OF GRID-BAR AIR WASH ON EFFICIENCY OF LINT CLEANERS AND FIBER QUALITY OF COTTON

Production Research Report No. 97

Agricultural Research Service
UNITED STATES DEPARTMENT OF AGRICULTURE

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Effects of Grid-Bar Air Wash on Efficiency of Lint Cleaners and Fiber Quality of Cotton

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SUMMARY

An experimental study was conducted by the U.S. Cotton Ginning Research Laboratory, Stoneville, Miss., to determine the effects of lint cleaner grid-bar air wash on the removal of foreign matter from ginned lint and on the fiber length distribution of the cleaned lint. During the 1965 season, 18 experimental test lots of cotton, divided into 54 sub-test lots, were ginned and put through one stage of saw-cylinder lint cleaning involving three air wash treatments at the lint cleaner. The experiment involved three replications and two levels of seed cotton cleaning. The two levels of seed cotton cleaning provided lint with foreign matter content levels of 7.41 and 9.38 percent. Treatments were no air wash, 1,000 c.f.m. air wash, and 2,000 c.f.m. air wash.

The experimental study indicated that a slight but significant decrease occurred in the foreign matter content of cleaned lint when an air wash of 2,000 c.f.m. was used instead of no air wash. However, no significant differences were shown in the cleaning efficiencies, grade indexes, or grades.

Staple length differences attributed to lint cleaner air wash were not detected by the cotton classer nor was the fiber length distribution of the cleaned lint affected, as determined by fiber arrays.

Lint cleaner waste contained considerable lint, for which the upper quartile length averaged 1.14 inches compared with 1.22 inches for cleaned lint.

The study also indicated that the use of large volumes of air for lint cleaner grid-bar wash and foreign matter removal is not a necessity in commercial gin plants. However, a small quantity of air wash might be desirable to maintain gin plant cleanness and to prevent ambient air pollution.

INTRODUCTION

The majority of lint cleaners employed in commercial gin plants utilize grid-bar air wash to re-

move waste from the lint cleaner and deliver it to an outside disposal area. High-capacity gin plants that employ multiple stages of lint cleaning have a large investment in lint cleaner air wash equipment—fans, motors, trash cyclones, piping, etc. In addition to initial cost, the operation of air wash machinery requires a sizable amount of additional power. A gin plant with a 12-bale-per-hour capacity and handling 16,000 c.f.m. of air for air wash needs approximately 4.5 kilowatt-hours per bale of additional power compared with a plant that does not use air wash.

This experimental study was performed to determine whether air wash is necessary to maintain fiber quality or whether other equipment requiring less investment and power, such as conveyor-trash belt, would suffice.

OBJECTIVES

The primary objective of this study was to determine the effect of lint cleaner grid-bar air wash on the removal of foreign matter from ginned lint and on the fiber length distribution of cleaned lint. Another objective was to collect the lint cleaner waste and examine its mass constituents. The study was given range by providing for two seed cotton drying and cleaning treatments and thus two levels of lint foreign matter.

METHODOLOGY

Harvesting, Classing, and Fiber Testing

Nine bales of Stoneville 7A variety cotton, grown by the Mississippi Agricultural Experiment Station, Delta Branch, Stoneville, Miss., and harvested with a spindle-type mechanical picker under the supervision of its personnel October 11, 1965, were used in the experimental test. The U.S. Department of Agriculture's Consumer and Marketing Service classed the samples at Greenwood, Miss., and made fiber tests at Clemson, S.C.

Ginning

Seed cotton drying, cleaning, and ginning were performed in the U.S. Cotton Ginning Research Laboratory's standard size gin plant employing a high-capacity gin stand and one stage of saw-cylinder lint cleaning.

Gin processing was performed October 13, 14, and 15. Each day three bales, comprising one replication, were ginned. Of this amount of cotton, $1\frac{1}{2}$ bales were passed through machinery for moderate seed cotton cleaning and $1\frac{1}{2}$ bales for minimum seed cotton cleaning. This provided seed cotton for the gin saws at two trash levels, and lint to the lint cleaner at two levels of foreign matter content. Gin machinery sequences through which cotton was passed for moderate and minimum seed cotton cleaning are described as follows:

Moderate cleaning—Master feed control, 24-shelf tower drier operated at 200° F., 6-cylinder cleaner, bur machine, 24-shelf tower drier operated at 200°, 7-cylinder cleaner, extractor-feeder, gin stand, and one stage of lint cleaning.

Minimum cleaning—Master feed control, 24-shelf tower drier operated at 200° F., 24-shelf tower drier operated at 200°, extractor-feeder, gin stand, and one stage of lint cleaning.

Seed cotton was processed through the gin plant at the rate of 4.2 bales per hour. Figure 1 shows the gin machinery sequence used in the experiment.

Lint Cleaning

For each of the three replications, seed cotton that had received the moderate and minimum cleaning treatments was further divided into test lots A, B, and C, and each of these was subjected to three lint cleaner air wash treatments. Sub-test lots weighed approximately 300 pounds. Actual lot weights were determined by weighing the wagon and seed cotton load before and after processing each lot.

Lint cleaner air wash treatments were as follows:

1. No air wash on lint cleaner. Waste fell into the lint cleaner trash duct by gravity.
2. 1,000 c.f.m. air wash. This air wash picked up waste behind lint cleaner grid bars by suction and delivered it through a 13-inch trash line to a cyclone outside the gin plant.
3. 2,000 c.f.m. air wash. Air wash delivered

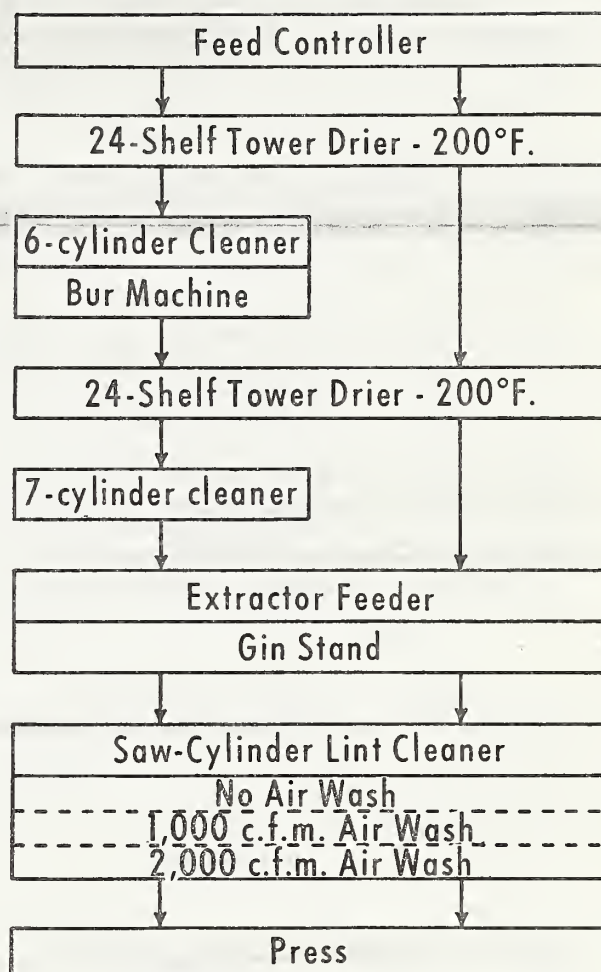


FIGURE 1.—Ginning sequence showing two seed cotton cleaning levels and three cleaner air wash treatments.

waste in the same manner as in 1,000 c.f.m. air wash treatment.

Required air wash volumes were obtained by adjusting a gate valve located in the trash line between lint cleaner and suction fan.

Lint cleaner saws 16 inches in diameter with 8 grid bars were used. Saws revolved 898 r.p.m. and had a combining ratio of 48:3. Saw-tooth distance from the grid bars was one-sixteenth of an inch.

The lint cleaner's trash bin was 66 inches long on the inside and its width between cleaner saw and bin wall ranged from 13.5 inches to 8.25 inches around the grid-bar circle. Thus, for the 1,000 c.f.m. air wash, air flow across the grid-bar area was 162 to 265 feet per minute and for the 2,000 c.f.m. air wash, 323 to 529 feet per minute.

Ambient temperature and relative humidity were recorded continuously while processing each experimental lot. Cotton moisture levels during the tests were estimated systematically by use of a portable electronic moisture meter. Actual moisture content of the test cotton was determined by oven drying test samples.

Wagon seed cotton trash level was determined by the fractionation procedure, and lint foreign matter content by use of the Shirley analyzer.

Samples for lint foreign matter content, classer's grade and staple, and fiber testing were obtained before lint cleaning and from cleaned lint on the lint slide. Waste removed by the lint cleaner treatment was weighed at the trash cyclone outside the gin plant. Lint cleaner waste was sampled for foreign matter level and fiber testing.

Fiber Tests

Ginned lint was tested for fiber fineness and maturity by the Micronaire and Causticaire tests. Samples from the various stages of processing were given the Suter-Webb array test for fiber length evaluation.

RESULTS

Statistical Analysis

Results were analyzed statistically as a factorial experiment. Experimental test factors were three replications, two seed cotton cleaning levels, and three lint cleaner air wash treatments. Tests were also performed to determine the interaction among these factors. Significance levels for foreign matter content and fiber length distribution are shown in appendix table 6.

Seed Cotton

Fractionation tests showed that wagon seed cotton trash contents were 6.9 percent, 6.2 percent, and 5.2 percent for replications 1, 2, and 3, respectively (table 1). (See also appendix tables 7 and 8.) Wagon seed cotton moisture levels, determined by the oven drying method, averaged 12.0 percent, 11.6 percent, and 13.0 percent for replications 1, 2, and 3, respectively.

Lint Moisture

During ginning and lint cleaning, ambient temperature ranged from 74° F. to 80°; relative humidity ranged from 51 to 77 percent. Lint

moisture samples taken between gin stand and lint cleaner showed that cotton given moderate cleaning had an average moisture content of 4.8 percent; that given the minimum cleaning treatment, 4.3 percent (appendix table 9).

Foreign Matter Content

Observations at the lint cleaner trash bin during the experimental tests showed that:

1. For no air wash, lint cleaner waste settled to bottom of trash bin, and a continuous mist or fog of fine lint cleaner trash was in the hopper and around the grid-bar areas.

2. For 1,000 c.f.m. air wash, lint cleaner waste moved sluggishly away from the grid bars and into the exhaust line. Trash fog or mist was not present near the grid-bar area.

3. For the 2,000 c.f.m. air wash, lint cleaner waste flowed readily from the grid-bar area and out of the trash bin. Residual mist or fog was not observed in the hopper during operation.

TABLE 1.—Trash and moisture contents in wagon samples of seed cotton given moderate and minimum cleaning¹

Item	Seed cotton cleaning level	Replication No.		
		1	2	3
Trash-----	Moderate-----	Percent 7.3	Percent 6.0	Percent 5.3
	Minimum-----	6.4	6.3	5.1
	Average-----	6.9	6.2	5.2
Moisture-----	Moderate-----	12.7	11.5	12.4
	Minimum-----	11.2	11.6	13.6
	Average-----	12.0	11.6	13.0

¹ Data are summarized from appendix tables 7 and 8.

Weight of lint cleaner waste determined by the cyclone-type collection system is a good indicator of the trash removed per bale by the different seed cotton cleaning treatments (table 2). (See also appendix table 10.) Waste removed by a single stage of saw-cylinder lint cleaner averaged 22.0 pounds from seed cotton that had received moderate cleaning and 32.5 pounds from that given minimum cleaning.

The 2,000 c.f.m. lint cleaner air wash treatment provided a slight but significant decrease in the content of foreign matter in cleaned lint compared

to that in lint not given an air wash treatment (table 3). (See also appendix tables 11 and 12.) However, these differences were not detected by the cotton classer.

Air wash treatments made no significant difference in foreign matter data shown as lint cleaner efficiency. Lint cleaner efficiency averaged 50.5 percent for the cotton that had been given a moderate seed cotton cleaning and 53.6 percent for that given a minimum seed cotton cleaning.

Samples of lint cleaner waste removed from cotton that had been given a moderate seed cotton cleaning contained 65.5 percent foreign matter and waste from cotton given the minimum cleaning, 73.7 percent.

TABLE 2.—Waste removed per bale by a single stage of saw-cylinder lint cleaner for stated replications and seed cotton cleaning treatments¹

Replication number	Seed cotton cleaning level	
	Moderate	Minimum
	Pounds/bale	Pounds/bale
1-----	24.2	33.0
2-----	21.2	32.2
3-----	20.6	32.2
Average-----	22.0	32.5

¹ Data are summarized from appendix table 10.

Grade

Air wash treatments made no significant difference in the grade indexes or in the grade of the cleaned lint (fig. 2). (See also appendix tables 13 and 14.) One stage of lint cleaning improved

TABLE 3.—Foreign matter content in cleaned lint and lint cleaner waste, and lint cleaner efficiency for stated levels of seed cotton cleaning¹

Seed cotton cleaning level	Foreign matter content in—				Lint cleaner efficiency for air wash treatment of—			
	Lint before cleaning	Cleaned lint given air wash treatment of—			Lint cleaner waste ²	No air wash	1,000 c.f.m.	2,000 c.f.m.
		No air wash	1,000 c.f.m.	2,000 c.f.m.				
Moderate-----	Percent 7.41	Percent 3.79	Percent 3.76	Percent 3.37	Percent 65.50	Percent 48.8	Percent 48.7	Percent 54.1
Minimum-----	9.38	4.58	4.17	4.30	73.73	51.5	55.5	53.9

¹ Data are summarized from appendix tables 11 and 12. ² Average of 3 lint cleaner treatments is shown.

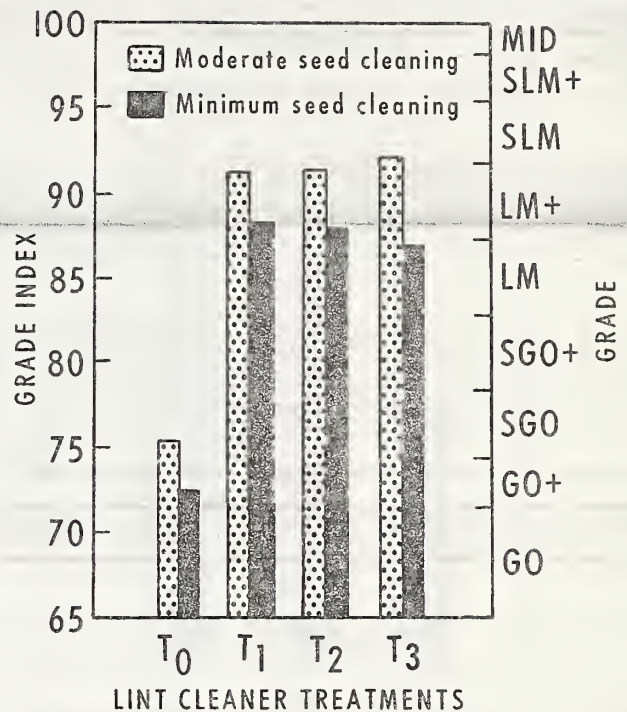


FIGURE 2.—Effects of lint cleaner air wash on grade and grade index for two seed cotton cleaning levels. T₀ is lint samples before lint cleaning; T₁, T₂, and T₃ are cleaned lint samples given no air wash; 1,000 c.f.m. air wash; and 2,000 c.f.m. air wash, respectively.

the grade of the moderate- and minimum-cleaned seed cotton approximately two grades over that of cotton before it passed through the lint cleaner. Moderate seed cotton cleaning with lint cleaning improved lint to the grade range of Low Middling Plus to Strict Low Middling; minimum seed cotton cleaning gave lint the grade range of Low Middling to Low Middling Plus.

Staple Length

No staple length differences were attributed to lint cleaner air wash treatment. All samples after lint cleaning, for both moderate and minimum seed cotton cleaning, gave a staple length of $1\frac{1}{6}$ inches (appendix table 15).

Fiber Fineness and Maturity

Fiber testing of samples taken from ginned lint indicated that cotton was of normal maturity (appendix table 16). For the study, Micronaire readings averaged 4.3. Causticaire test gave lint a maturity index of 77 percent and a fineness of 4.6 micrograms per inch.

Fiber Length Distribution

No significant differences were detected in upper quartile length, mean length, or in coefficient of variation as a result of lint cleaner air wash treatment. For the experimental study, cleaned lint had an average upper quartile length of 1.22 inches, a mean length of 0.95 of an inch, and a coefficient of variation of 36.4 percent (table 4). (See also appendix tables 17, 18, and 19.) An analysis of the lint cleaner waste collected at the cyclone showed that it contained a considerable quantity of usable material. The upper quartile length, mean length, and coefficient of variation of this usable material averaged 1.14 inches, 0.83 of an inch, and 45.5 percent, respectively.

The proportion of fibers longer than 1 inch, that of fibers ranging from one-half to 1 inch in length, and that of fibers shorter than one-half inch averaged 52.8 percent, 33.0 percent, and 14.2 percent, respectively, for the study (table 5). (See also appendix tables 20, 21, and 22.) No significant differences in these lengths were attributed to lint air wash treatment. Arrays of lint cleaner waste showed it had a lower percentage of fibers longer than 1 inch than was in cleaned lint, a high percentage of fiber one-half to 1 inch in length, and a higher percentage of fibers shorter than one-half inch (fig. 3). For the study these percentages averaged 38.7, 37.0, and 24.3, respectively.

RECOMMENDATIONS

Actual measurements of air and horsepower used in a high-capacity commercial cotton ginning plant, having multiple stages of lint cleaning,

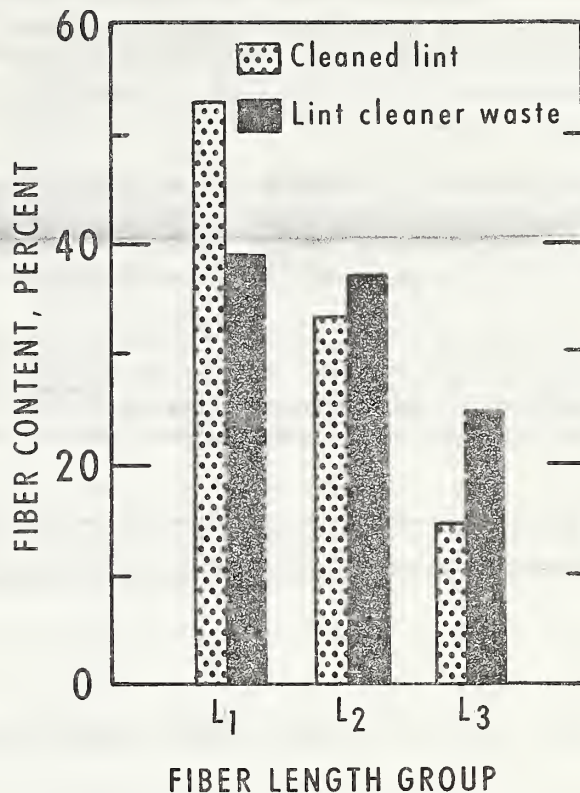


FIGURE 3.—Fiber length distribution of cleaned lint and lint cleaner waste. L₁ shows percentage of fibers longer than 1 inch; L₂, those one-half to 1 inch in length; and L₃, those shorter than one-half inch.

indicated that air volumes of about 16,000 c.f.m. were being moved by 72 horsepower for lint cleaner grid-bar air wash alone. The air system consisted of centrifugal fans discharging into cyclones. Lint cleaning consisted of two batteries of three unit lint cleaners followed by a third stage in a split-stream arrangement. Thus, with a ginning capacity of approximately 12 bales per hour, air wash required 4.5 kilowatt-hours of energy per bale. This describes a fairly typical installation.

This study showed that grid-bar trash air wash is not a necessity that affects fiber quality but is a means of disposing of lint cleaner waste and preventing ambient air pollution. A reduction in air wash volume to 8,000 c.f.m. (1,000 c.f.m. per lint cleaner as employed in one of the study's treatments) would result in considerable power savings. This study showed that with a suitable air system, an air wash of 1,000 c.f.m. per lint cleaner is sufficient for transporting the waste material and preventing gin plant air pollution. Reducing the

air volume to 8,000 c.f.m. by use of a centrifugal-type fan system allows a reduction in the power requirements for air wash by about 45 percent, or to 2.5 kilowatt-hours per bale.

Power requirements can be reduced still more if the 8,000 c.f.m. of air is moved by using a vane-axial fan in conjunction with a condenser instead of a centrifugal fan-cyclone system. If this is done, power requirements are reduced by approximately 83 percent, or to 0.8 of a kilowatt-hour per bale.

Moving lint cleaner waste by use of a conveyor belt would probably require the least power. However, the use of only the belt leaves the

problem of air pollution still to be considered. An additional method would have to be provided for removing polluted air and for removing waste material at the conveyor belt trash collection point.

Therefore, an air wash of 1,000 c.f.m. per lint cleaner is recommended. This can be obtained in two ways: (1) By the use of a centrifugal fan and discharging the motes through the fan and into a cyclone collector; and (2) the more economical way, by use of a vane-axial-type fan pulling through a suction condenser and discharging the motes into a mote press or an existing trash fan.

APPENDIX

TABLE 4.—*Fiber lengths of lint before cleaning and of cleaned lint and lint cleaner waste after grid-bar air wash treatments*

Item	Seed cotton trash level ²	Fiber length of lint ¹				
		Before cleaning	After cleaning and air wash treatment of—			In lint cleaner waste after air wash ³
			No air wash	1,000 c.f.m.	2,000 c.f.m.	
Upper quartile length.....inches..	Light.....	1.23	1.22	1.21	1.23	1.12
	Heavy.....	1.22	1.22	1.22	1.22	1.15
	Average....	1.23	1.22	1.22	1.23	1.14
Mean length.....inches..	Light.....	.96	.95	.94	.96	.81
	Heavy.....	.95	.95	.95	.95	.85
	Average....	.96	.95	.95	.96	.83
Coefficient of variation.....percent..	Light.....	36.0	36.7	36.8	36.2	46.4
	Heavy.....	35.9	36.4	35.9	36.0	44.5
	Average....	36.0	36.6	36.4	36.1	45.5

¹ Data are summarized from appendix tables 17, 18, and 19.

² Light seed cotton trash level means the trash in seed

cotton given moderate cleaning; heavy seed cotton trash level, the trash in seed cotton given minimum cleaning.

³ Average from 3 lint cleaner treatments is shown.

TABLE 5.—*Fiber length distribution in lint before cleaning and in cleaned lint and lint cleaner waste after air wash treatments*

Item	Seed cotton trash level ²	Fiber length distribution of lint— ¹				
		Before cleaning	After cleaning and air wash treatment of—			In lint cleaner waste after air wash ³
			No air wash	1,000 c.f.m.	2,000 c.f.m.	
Percentage of fibers longer than 1 inch..	Light.....	53.6	52.6	51.6	54.0	36.6
	Heavy.....	53.2	52.6	53.2	52.9	40.7
	Average....	53.4	52.6	52.3	53.5	38.7
Percentage of fibers ½ to 1 inch in length.	Light.....	32.6	33.1	33.7	32.0	37.5
	Heavy.....	32.8	33.0	32.9	33.2	36.5
	Average....	32.7	33.1	33.3	32.6	37.0
Percentage of fibers shorter than ½ inch..	Light.....	13.8	14.3	14.7	14.0	25.9
	Heavy.....	14.0	14.4	13.7	13.9	22.8
	Average....	13.9	14.4	14.2	14.0	24.3

¹ Data are summarized from appendix tables 20, 21, and 22.

² Light seed cotton trash level means the trash in seed

cotton given moderate cleaning; heavy seed cotton trash level, the trash in seed cotton given minimum cleaning.

³ Average of 3 lint cleaner air wash treatments.

TABLE 6.—Results of statistical analyses for stated experimental factors and cotton features, crop of 1965

Item	Test results for differences among factors ¹						
	Seed cotton cleaning level	Air wash	Replication	Interactions ²			
				SC × AW	AW × REP	SC × REP	SC × AW × REP
Lint foreign matter content.....	**	*	**	NS	NS	NS	NS
Lint cleaning efficiency.....	*	NS	NS	NS	NS	*	NS
Grade index.....	**	NS	**	NS	NS	**	NS
Staple length.....	NS	NS	NS	NS	NS	NS	NS
Upper quartile length.....	NS	NS	**	NS	NS	NS	NS
Mean length.....	NS	NS	**	NS	NS	NS	NS
Coefficient of length variation.....	NS	NS	*	NS	NS	NS	NS
Fibers longer than 1 inch.....	NS	NS	**	NS	NS	NS	NS
Fibers ½ to 1 inch in length.....	NS	NS	**	NS	NS	NS	NS
Fibers shorter than ½ inch.....	NS	NS	*	NS	NS	NS	NS

¹ ** means significant at the 1-percent level; *, significant at the 5-percent level; and NS, not significant.

² SC means seed cotton cleaning level; AW, air wash on lint cleaner; and REP, replication.

TABLE 7.—Wagon trash content of seed cotton given moderate and minimum cleaning, crop of 1965

Seed cotton cleaning level and replication number	Test lot	Wagon trash content of cotton given lint cleaner air wash treatment of— ¹			
		No air wash	1,000 c.f.m.	2,000 c.f.m.	
Moderate:	1-----	A-----	8.0	8.3	6.6
		B-----	9.0	6.7	6.6
		C-----	8.2	6.3	5.9
	Average--	8.4	7.1	6.4	
	2-----	A-----	5.6	6.5	6.0
		B-----	6.1	6.4	6.5
		C-----	5.6	5.5	5.6
	Average--	5.8	6.1	6.0	
	3-----	A-----	5.3	4.9	4.9
		B-----	5.0	5.7	5.1
C-----		5.7	5.8	5.3	
Average--	5.3	5.5	5.1		
Average--	-----	6.5	6.2	5.8	
Minimum:	1-----	A-----	8.4	7.4	6.9
		B-----	6.0	6.2	6.0
		C-----	5.9	5.7	5.2
	Average--	6.8	6.4	6.0	
	2-----	A-----	5.3	6.1	5.3
		B-----	6.2	6.2	6.4
		C-----	7.7	8.1	5.4
	Average--	6.4	6.8	5.7	
	3-----	A-----	4.2	4.0	5.0
		B-----	4.9	6.7	5.4
C-----		5.5	5.2	5.1	
Average--	4.9	5.3	5.2		
Average--	-----	6.0	6.2	5.6	

¹ Wagon seed cotton trash content for each test lot is an average of 3 fractionation samples.

TABLE 8.—Wagon moisture content of seed cotton given moderate and minimum cleaning, crop of 1965

Seed cotton cleaning level and replication number	Test lot	Wagon moisture content of cotton given lint cleaner air wash treatment of— ¹			
		No air wash	1,000 c.f.m.	2,000 c.f.m.	
Moderate:	1-----	A-----	11.2	13.2	10.7
		B-----	15.5	11.4	13.9
		C-----	14.1	11.9	12.3
	Average--	13.6	12.2	12.3	
	2-----	A-----	10.7	10.9	10.7
		B-----	13.1	10.9	12.6
		C-----	12.0	11.0	11.6
	Average--	11.9	10.9	11.6	
	3-----	A-----	11.1	12.7	13.3
		B-----	13.9	12.5	11.6
C-----		11.5	12.5	12.3	
Average--	12.2	12.6	12.4		
Average--	-----	12.6	11.9	12.1	
Minimum:	1-----	A-----	11.0	11.7	12.0
		B-----	11.9	11.5	11.4
		C-----	11.1	9.9	10.3
	Average--	11.3	11.0	11.2	
	2-----	A-----	11.7	10.2	12.6
		B-----	12.0	11.9	10.8
		C-----	11.8	12.7	11.1
	Average--	11.8	11.6	11.5	
	3-----	A-----	12.4	11.8	14.4
		B-----	13.0	14.8	13.3
C-----		14.1	13.6	14.9	
Average--	13.2	13.4	14.2		
Average--	-----	12.1	12.0	12.3	

¹ Wagon seed cotton moisture content for each test lot is an average of 3 oven-dried moisture determinations.

TABLE 9.—Fiber moisture of cotton between gin stand and lint cleaner by level of seed cotton cleaning and replication, crop of 1965¹

Seed cotton cleaning level and replication number	Test lot	Moisture between gin stand and cleaner of cotton given air wash treatment of—		
		No air wash	1,000 c.f.m.	2,000 c.f.m.
Moderate: 1-----	A-----	5.5	4.5	4.7
	B-----	4.5	4.5	4.2
	C-----	5.3	4.4	4.6
	Average--	5.1	4.5	4.5
2-----	A-----	4.6	4.2	4.1
	B-----	4.7	3.9	4.1
	C-----	4.3	3.9	3.8
	Average--	4.5	4.0	4.0
3-----	A-----	6.2	5.8	6.2
	B-----	5.9	5.0	5.0
	C-----	5.2	4.5	4.9
	Average--	5.8	5.1	5.4
Average--	5.1	4.5	4.6	
Minimum: 1-----	A-----	4.7	4.4	4.4
	B-----	5.3	4.3	4.4
	C-----	4.5	4.2	4.3
	Average--	4.8	4.3	4.4
2-----	A-----	4.3	3.8	3.9
	B-----	4.3	3.5	3.5
	C-----	3.8	3.7	3.7
	Average--	4.1	3.7	3.7
3-----	A-----	4.8	5.3	5.0
	B-----	4.9	4.4	4.9
	C-----	4.4	4.2	4.3
	Average--	4.7	4.6	4.7
Average--	4.5	4.2	4.3	

¹ Fiber moisture content for each lot is an average of 3 oven-dried samples taken between gin stand and lint cleaner. Ambient conditions during replications 1, 2, and 3 were: 73.8° F. at 66.5 percent relative humidity; 80.1° at 51.0 percent relative humidity; and 74.7° at 77.5 percent relative humidity, respectively.

TABLE 10.—Waste removed per bale by saw-cylinder lint cleaner for stated levels of seed cotton cleaning, crop of 1965¹

Seed cotton cleaning level and replication number	Test lot	Waste removed by lint cleaner when air wash treatment was— ²		
		No air wash	1,000 c.f.m.	2,000 c.f.m.
Moderate: 1-----	A-----	21.75	28.43	22.25
	B-----	31.88	23.89	23.92
	C-----	24.80	19.53	20.94
	Average--	26.14	23.95	22.37
2-----	A-----	19.97	19.97	21.81
	B-----	24.77	20.49	20.61
	C-----	19.61	21.00	20.36
	Average--	22.19	20.49	20.93
3-----	A-----	15.00	20.60	22.20
	B-----	18.62	21.80	19.74
	C-----	22.65	21.35	23.40
	Average--	18.76	21.25	21.78
Average--	22.36	21.90	21.69	
Minimum: 1-----	A-----	31.71	35.88	34.47
	B-----	22.47	34.43	33.18
	C-----	38.15	31.50	33.72
	Average--	30.78	34.27	33.79
2-----	A-----	31.67	33.72	27.56
	B-----	30.00	34.29	32.66
	C-----	31.95	36.50	31.91
	Average--	31.21	34.83	30.71
3-----	A-----	27.72	27.72	36.54
	B-----	28.85	32.18	34.91
	C-----	37.16	23.69	-----
	Average--	33.01	27.86	35.73
Average--	31.67	32.32	33.41	

¹ Waste was caught at cyclone and weighed for 300-pound seed cotton test lot. This amount was used to calculate weight removed per bale, assuming 1,500 pounds per bale of seed cotton. Ginning rate was 4.2 bales per hour.

² Lint was ginned on high-capacity gin and then given 1 stage of saw-cylinder lint cleaning.

TABLE 11.—Foreign matter content of lint after grid-bar air wash by stated seed cotton cleaning levels, crop of 1965

Seed cotton cleaning level and replication number	Test lot	Foreign matter content of lint ¹						
		Before cleaning ²	After cleaning and air wash treatment of—			In lint cleaner waste after air wash treatment of—		
			No air wash	1,000 c.f.m.	2,000 c.f.m.	No air wash	1,000 c.f.m.	2,000 c.f.m.
Moderate:		<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1-----	A-----	9.20	3.92	3.91	3.92	77.26	75.50	59.22
	B-----	9.30	3.85	4.85	3.44	66.56	62.84	56.92
	C-----	7.25	4.77	3.87	3.52	76.20	75.46	68.32
	Average-----	8.58	4.18	4.21	3.63	73.34	71.27	61.49
2-----	A-----	5.68	3.92	3.61	2.62	65.74	69.04	59.92
	B-----	7.17	3.46	3.27	3.25	66.30	61.12	55.48
	C-----	6.85	3.40	3.42	3.21	63.38	60.74	55.72
	Average-----	6.57	3.59	3.43	3.03	65.14	63.63	57.04
3-----	A-----	7.53	3.99	4.01	4.02	64.96	69.38	63.46
	B-----	6.70	3.49	3.64	3.31	70.54	66.94	62.16
	C-----	6.98	3.35	3.28	3.06	72.00	68.54	54.72
	Average-----	7.07	3.61	3.64	3.46	69.17	68.29	60.11
Average-----		7.41	3.79	3.76	3.37	69.22	67.73	59.55
Minimum:								
1-----	A-----	10.21	5.07	5.21	4.40	78.92	83.40	72.78
	B-----	8.88	5.34	4.09	4.39	83.96	76.92	65.68
	C-----	9.08	5.28	4.01	4.56	69.58	61.74	64.16
	Average-----	9.39	5.23	4.44	4.45	77.49	74.02	67.54
2-----	A-----	10.20	4.32	4.39	4.31	63.32	74.26	70.72
	B-----	10.16	4.99	4.09	4.33	78.18	81.60	63.64
	C-----	9.57	4.16	3.98	4.02	64.88	75.92	72.84
	Average-----	9.98	4.49	4.15	4.22	68.79	77.26	69.07
3-----	A-----	8.24		3.90	4.42		77.40	72.52
	B-----	9.26	4.05	4.04	4.22	81.60	76.54	73.86
	C-----	8.84	4.01	3.83	4.04	78.88	75.50	71.64
	Average-----	8.78	4.03	3.92	4.23	80.24	76.48	72.67
Average-----		9.38	4.58	4.17	4.30	75.51	75.92	69.76

¹ Based on 1 pass through Shirley analyzer.² Trash content for each test lot is an average of 3 samples. Differences in foreign matter content of cleaned

lint for no air wash and 2,000 c.f.m. are significant at the 5-percent level.

TABLE 12.—*Lint cleaner efficiency by stated seed cotton trash levels, crop of 1965*

Seed cotton cleaning level and replication number	Test lot	Lint cleaner efficiency for air wash treatment of— ^{1 2}		
		No air wash	1,000 c.f.m.	2,000 c.f.m.
Moderate: 1-----	A-----	Percent 57.4	57.5	57.4
	B-----	58.6	47.8	63.0
	C-----	34.2	46.6	51.4
	Average--	50.1	50.6	57.3
2-----	A-----	40.0	36.4	53.9
	B-----	51.7	54.4	54.7
	C-----	50.4	50.1	53.1
	Average--	47.4	47.0	53.9
3-----	A-----	47.0	46.7	46.6
	B-----	47.9	45.7	50.6
	C-----	52.0	53.0	56.2
	Average--	49.0	48.5	51.1
Average--	48.8	48.7	54.1	
Minimum: 1-----	A-----	50.3	49.0	56.9
	B-----	39.9	53.9	50.6
	C-----	41.9	55.8	49.8
	Average--	44.0	52.9	52.4
2-----	A-----	57.6	57.0	57.7
	B-----	50.9	59.7	57.4
	C-----	56.5	58.4	58.0
	Average--	55.0	58.4	57.7
3-----	A-----	52.7	52.7	46.4
	B-----	56.3	56.4	54.4
	C-----	54.6	56.7	54.3
	Average--	55.5	55.3	51.7
Average--	51.5	55.5	53.9	

¹ Efficiencies are based on foreign matter data of appendix table 11.

² The cleaning efficiency of a lint cleaner is defined as the ratio of foreign matter removed from cotton to the foreign matter content of the cotton as it entered the lint cleaner, multiplied by 100 percent. No significant differences in lint cleaner efficiency were attributed to lint cleaner air wash treatment.

TABLE 13.—*Effect of lint cleaner grid-bar air wash on classer's grade index, crop of 1965*

Seed cotton cleaning level and replication number	Test lot	Grade index ^{1 2}			
		Before lint cleaning	After one lint cleaner and air wash treatment of—		
		No air wash	1,000 c.f.m.	2,000 c.f.m.	
Moderate: 1-----	A-----	Index 74.0	Index 90.0	Index 91.3	Index 92.7
	B-----	74.0	90.0	90.0	92.7
	C-----	76.0	90.0	90.0	92.7
	Average--	74.7	90.0	90.4	92.7
2-----	A-----	76.0	92.7	91.3	92.7
	B-----	75.0	90.0	90.0	91.3
	C-----	76.0	91.3	91.3	91.3
	Average--	75.7	91.3	90.9	91.8
3-----	A-----	75.0	90.0	92.7	91.3
	B-----	76.0	92.7	91.3	91.3
	C-----	76.0	94.0	94.0	94.0
	Average--	75.7	92.2	92.7	92.2
Average--	75.4	91.2	91.3	92.2	
Minimum: 1-----	A-----	68.7	90.0	90.0	81.0
	B-----	72.0	81.0	82.3	79.3
	C-----	74.0	81.0	81.0	81.0
	Average--	71.6	84.0	84.4	80.4
2-----	A-----	73.0	90.0	90.0	91.3
	B-----	73.0	90.0	90.0	90.0
	C-----	73.0	90.0	90.0	90.0
	Average--	73.0	90.0	90.0	90.4
3-----	A-----	73.0	90.0	90.0	90.0
	B-----	73.0	91.3	90.0	90.0
	C-----	73.0	90.0	90.0	90.0
	Average--	73.0	90.7	90.0	90.0
Average--	72.5	88.2	88.1	86.9	

¹ Grade index for each test lot is an average of 3 samples. No significant differences in grade index were attributed to lint cleaner air wash treatment.

² Grade index and the corresponding grade designations are: 100=M; 97=SLM+; 94=SLM; 90=LM+; 85=LM; 81=SGO+; 76=SGO; 73=GO+; 70=GO; and 60=BG. See appendix table 14.

TABLE 14.—Effect of lint cleaner grid-bar air wash on classer's grade, crop of 1965

Seed cotton cleaning level and replication number	Test lot	Classer's grade ¹				
		Before lint cleaning	After one lint cleaner and air wash treatment of—			
			No air wash	1,000 c.f.m.	2,000 c.f.m.	
Moderate:	1.....	A.....	GO+	LM+	LM+	SLM
		B.....	GO+	LM+	LM+	SLM
		C.....	SGO	LM+	LM+	SLM
		Average.....	SGO	LM+	LM+	SLM
	2.....	A.....	SGO	SLM	LM+	SLM
		B.....	SGO	LM+	LM+	LM+
		C.....	SGO	LM+	LM+	LM+
		Average.....	SGO	LM+	LM+	LM+
		A.....	SGO	LM+	SLM	LM+
		B.....	SGO	SLM	LM+	LM+
		C.....	SGO	SLM	SLM	SLM
		Average.....	SGO	SLM	SLM	SLM
Average.....		SGO	LM+	LM+	SLM	
Minimum:	1.....	A.....	GO	LM+	LM+	SGO+
		B.....	GO+	SGO+	SGO+	SGO+
		C.....	GO+	SGO+	SGO+	SGO+
		Average.....	GO+	LM	LM	SGO+
	2.....	A.....	GO+	LM+	LM+	LM+
		B.....	GO+	LM+	LM+	LM+
		C.....	GO+	LM+	LM+	LM+
		Average.....	GO+	LM+	LM+	LM+
	3.....	A.....	GO+	LM+	LM+	LM+
		B.....	GO+	LM+	LM+	LM+
		C.....	GO+	LM+	LM+	LM+
		Average.....	GO+	LM+	LM+	LM+
Average.....		GO+	LM+	LM+	LM	

¹ Grade for each test lot is an average of 3 samples. Grades were calculated from grade indexes of appendix table 13.

TABLE 15.—Staple length of lint before cleaning and after air wash treatment, crop of 1965

Seed cotton cleaning level and replication number	Test lot	Staple length ¹			
		Before lint cleaning	After one lint cleaner and air wash treatment of—		
			No air wash	1,000 c.f.m.	2,000 c.f.m.
Moderate:		<i>32ds in.</i>	<i>32ds in.</i>	<i>32ds in.</i>	<i>32ds in.</i>
1-----	A-----	33.0	34.0	34.0	34.0
	B-----	33.0	34.0	34.0	34.0
	C-----	33.0	34.0	34.0	34.0
	Average--	33.0	34.0	34.0	34.0
2-----	A-----	34.0	34.0	34.0	34.0
	B-----	33.7	34.0	34.0	34.0
	C-----	34.0	34.0	34.0	34.0
	Average--	33.9	34.0	34.0	34.0
3-----	A-----	33.7	34.0	34.0	34.0
	B-----	34.0	34.0	34.0	34.0
	C-----	34.0	34.0	34.0	34.0
	Average--	33.9	34.0	34.0	34.0
Average--		33.6	34.0	34.0	34.0
Minimum:					
1-----	A-----	33.0	34.0	34.0	34.0
	B-----	33.0	34.0	34.0	34.0
	C-----	33.0	34.0	34.0	34.0
	Average--	33.0	34.0	34.0	34.0
2-----	A-----	33.0	34.0	34.0	34.0
	B-----	33.0	34.0	34.0	34.0
	C-----	33.0	34.0	34.0	34.0
	Average--	33.0	34.0	34.0	34.0
3-----	A-----	33.0	34.0	34.0	34.0
	B-----	33.0	34.0	34.0	34.0
	C-----	33.0	34.0	34.0	34.0
	Average--	33.0	34.0	34.0	34.0
Average--		33.0	34.0	34.0	34.0

¹ Staple length for each test lot is an average of 3 samples. No significant staple length differences were attributed to lint cleaner air wash treatment.

TABLE 16.—Fiber maturity data, crop of 1965

Replication No.	Trial	Causticaire ¹		Micronaire reading
		Maturity index	Fineness	
		<i>Percent</i>	<i>Micrograms per inch</i>	
1-----	1-----	76	4.4	4.1
	2-----	74	4.6	4.1
	3-----	80	4.6	4.4
	Average--	77	4.5	4.2
2-----	1-----	76	4.8	4.3
	2-----	76	4.6	4.2
	3-----	78	4.7	4.4
	Average--	77	4.7	4.3
3-----	1-----	78	4.4	4.3
	2-----	76	4.7	4.3
	3-----	76	4.6	4.2
	Average--	77	4.6	4.3
Average--		77	4.6	4.3

¹ Data for each trial are averages of 2 determinations.

TABLE 17.—Upper quartile length of lint before cleaning and of cleaned lint and lint cleaner waste after grid-bar air wash, crop of 1965

Seed cotton cleaning level and replication number	Test lot	Upper quartile length of lint ¹						
		Before cleaning	After cleaning and air wash treatment of—			In lint cleaner waste collected after air wash treatment of—		
			No air wash	1,000 c.f.m.	2,000 c.f.m.	No air wash	1,000 c.f.m.	2,000 c.f.m.
Moderate:		<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
1	A	1. 21	1. 21	1. 20	1. 22	1. 15	1. 12	1. 05
	B	1. 20	1. 21	1. 20	1. 21	1. 10	1. 12	1. 02
	C	1. 24	1. 24	1. 24	1. 26	1. 17	1. 20	1. 16
	Average	1. 22	1. 22	1. 21	1. 23	1. 14	1. 15	1. 08
2	A	1. 19	1. 21	1. 18	1. 20	1. 11	1. 07	1. 06
	B	1. 24	1. 19	1. 23	1. 22	1. 08	1. 11	1. 07
	C	1. 22	1. 21	1. 21	1. 24	1. 10	1. 12	1. 07
	Average	1. 22	1. 20	1. 21	1. 22	1. 10	1. 10	1. 07
3	A	1. 28	1. 25	1. 25	1. 20	1. 11	1. 18	1. 10
	B	1. 25	1. 23	1. 23	1. 26	1. 15	1. 16	1. 11
	C	1. 24	1. 22	1. 19	1. 25	1. 20	1. 15	1. 08
	Average	1. 26	1. 23	1. 22	1. 24	1. 15	1. 16	1. 10
	Average	1. 23	1. 22	1. 21	1. 23	1. 13	1. 14	1. 08
Minimum:								
1	A	1. 22	1. 22	1. 20	1. 21	1. 09	1. 20	1. 17
	B	1. 23	1. 18	1. 21	1. 21	1. 18	1. 10	1. 12
	C	1. 18	1. 22	1. 20	1. 23	1. 13	1. 18	1. 12
	Average	1. 21	1. 21	1. 20	1. 22	1. 13	1. 16	1. 14
2	A	1. 22	1. 21	1. 23	1. 20	1. 11	1. 12	1. 13
	B	1. 21	1. 22	1. 22	1. 19	1. 14	1. 15	1. 14
	C	1. 18	1. 16	1. 17	1. 19	1. 15	1. 20	1. 08
	Average	1. 20	1. 20	1. 21	1. 19	1. 13	1. 16	1. 12
3	A	1. 26	1. 25	1. 25	1. 22	1. 13	1. 17	1. 17
	B	1. 22	1. 29	1. 23	1. 24	1. 19	1. 14	1. 15
	C	1. 25	1. 23	1. 25	1. 28	1. 20	1. 15	1. 16
	Average	1. 24	1. 26	1. 24	1. 25	1. 20	1. 14	1. 16
	Average	1. 22	1. 22	1. 22	1. 22	1. 15	1. 15	1. 14

¹ Upper quartile length for each test lot is an average of 2 determinations. No significant differences in upper quartile

length of cleaned lint were attributed to lint cleaner air wash treatment.

TABLE 18.—Fiber mean length of lint before cleaning and of cleaned lint and lint cleaner waste after grid-bar air wash, crop of 1965

Seed cotton cleaning level and replication number	Test lot	Fiber mean length of lint ¹						
		Before cleaning	After cleaning and air wash treatment of—			In lint cleaner waste collected after air wash of—		
			No air wash	1,000 c.f.m.	2,000 c.f.m.	No air wash	1,000 c.f.m.	2,000 c.f.m.
Moderate:		<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
1.....	A.....	0.93	0.95	0.94	0.92	0.82	0.84	0.72
	B.....	.90	.93	.91	.93	.83	.79	.71
	C.....	.98	.98	.98	.99	.85	.92	.87
	Average.....	.94	.95	.94	.95	.83	.85	.77
2.....	A.....	.91	.93	.89	.92	.78	.79	.72
	B.....	.95	.91	.95	.94	.78	.78	.76
	C.....	.95	.92	.94	.98	.78	.78	.78
	Average.....	.94	.92	.93	.95	.78	.78	.75
3.....	A.....	1.04	1.00	.99	.92	.81	.85	.77
	B.....	1.00	.96	.95	1.01	.88	.84	.77
	C.....	.97	.95	.92	.99	.92	.83	.79
	Average.....	1.00	.97	.95	.97	.87	.84	.78
Average.....		.96	.95	.94	.96	.83	.82	.77
Minimum:								
1.....	A.....	.93	.96	.92	.94	.77	.89	.87
	B.....	.95	.91	.94	.95	.90	.77	.81
	C.....	.91	.95	.94	.97	.86	.91	.80
	Average.....	.93	.94	.93	.95	.84	.86	.83
2.....	A.....	.93	.94	.97	.94	.79	.80	.84
	B.....	.95	.93	.97	.90	.81	.88	.81
	C.....	.91	.89	.89	.91	.86	.89	.74
	Average.....	.93	.92	.94	.92	.82	.86	.80
3.....	A.....	1.02		.98	.95		.80	.90
	B.....	.96	1.02	.97	.98	.87	.87	.84
	C.....	1.01	.95	1.00	1.01	.87	.89	.82
	Average.....	1.00	.99	.98	.98	.87	.85	.85
Average.....		.95	.95	.95	.95	.84	.86	.84

¹ Data for each test lot are an average of 2 fiber array determinations. No significant differences in mean length of cleaned lint were attributed to lint cleaner air wash treatment.



TABLE 19.—Coefficient of variation of lint before cleaning and of cleaned lint and lint cleaner waste after grid-bar air wash, crop of 1965

Seed cotton cleaning level and replication number	Test lot	Coefficient of variation of lint ¹						
		Before cleaning	After cleaning and air wash treatment of—			In lint cleaner waste collected after air wash treatment of—		
			No air wash	1,000 c.f.m.	2,000 c.f.m.	No air wash	1,000 c.f.m.	2,000 c.f.m.
Moderate:		<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1	A	38.0	36.0	36.0	39.0	47.0	41.0	54.0
	B	40.0	38.0	40.0	38.0	40.0	49.0	53.0
	C	35.0	35.0	35.0	34.0	45.0	39.0	41.0
	Average	37.7	36.3	37.0	37.0	44.0	43.0	49.3
2	A	38.0	37.0	39.0	38.0	48.0	45.0	55.0
	B	37.0	38.0	36.0	36.0	45.0	49.0	48.0
	C	36.0	38.0	37.0	34.0	50.0	49.0	45.0
	Average	37.0	37.7	37.3	36.0	47.7	47.7	49.3
3	A	31.0	34.0	34.0	39.0	46.0	46.0	52.0
	B	34.0	37.0	37.0	34.0	41.0	44.0	50.0
	C	35.0	37.0	37.0	34.0	38.0	46.0	45.0
	Average	33.3	36.0	36.0	35.7	41.7	45.3	49.0
	Average	36.0	36.7	36.8	36.2	44.6	45.3	49.2
Minimum:								
1	A	39.0	35.0	38.0	36.0	50.0	42.0	41.0
	B	36.0	37.0	36.0	35.0	39.0	51.0	47.0
	C	37.0	36.0	36.0	35.0	40.0	38.0	48.0
	Average	37.3	36.0	36.7	35.3	43.0	43.7	45.3
2	A	38.0	38.0	35.0	35.0	48.0	47.0	42.0
	B	38.0	39.0	34.0	40.0	47.0	40.0	47.0
	C	38.0	38.0	39.0	38.0	41.0	41.0	54.0
	Average	37.3	38.3	36.0	37.7	45.3	42.7	47.7
3	A	32.0	36.0	36.0	36.0	48.0	47.0	47.0
	B	35.0	34.0	36.0	35.0	44.0	40.0	46.0
	C	32.0	36.0	33.0	34.0	44.0	38.0	48.0
	Average	33.0	35.0	35.0	35.0	44.0	42.0	47.0
	Average	35.9	36.4	35.9	36.0	44.1	42.8	46.7

¹ Data for each test lot are averages of 2 fiber array determinations. No significant differences in coefficient of variation of cleaned lint were attributed to lint cleaner air wash treatment.



TABLE 20.—Percentage of fibers longer than 1 inch in lint before cleaning and in cleaned lint and lint cleaner waste after grid-bar air wash, crop of 1965

Seed cotton cleaning level and replication number	Test lot ¹	Fibers longer than 1 inch in lint						
		Before cleaning	After cleaning and air wash treatment of—			In lint cleaner waste collected after air wash treatment of—		
			No air wash	1,000 c.f.m.	2,000 c.f.m.	No air wash	1,000 c.f.m.	2,000 c.f.m.
Moderate:		<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1.....	A.....	49.5	53.5	53.6	50.4	39.3	39.0	29.1
	B.....	45.2	50.0	48.0	51.6	35.0	38.1	26.7
	C.....	56.2	58.7	56.7	60.6	42.6	47.8	40.5
	Average.....	50.3	54.1	52.8	54.2	39.0	41.6	32.1
2.....	A.....	47.8	49.3	45.1	49.4	35.1	31.1	30.5
	B.....	51.3	46.6	50.9	50.3	31.5	35.8	31.8
	C.....	51.9	48.7	50.3	56.1	34.5	36.3	30.5
	Average.....	50.3	48.2	48.8	51.9	33.7	34.4	30.9
3.....	A.....	65.9	59.2	58.4	48.1	35.8	43.1	33.3
	B.....	59.7	55.3	52.0	60.6	44.4	40.7	34.1
	C.....	55.0	52.2	49.3	59.2	49.6	39.8	32.2
	Average.....	60.2	55.6	53.2	56.0	43.3	41.2	33.2
Average.....		53.6	52.6	51.6	54.0	38.7	39.1	32.1
Minimum:								
1.....	A.....	51.0	55.2	49.3	50.4	32.8	49.6	44.1
	B.....	53.0	48.9	50.9	53.0	45.0	34.9	37.5
	C.....	48.4	53.3	51.2	56.8	38.1	48.2	36.0
	Average.....	50.8	52.5	50.5	53.4	38.6	44.2	39.2
2.....	A.....	50.1	50.8	54.2	50.3	35.5	36.1	37.2
	B.....	52.1	49.6	55.7	45.4	38.2	43.9	40.1
	C.....	45.5	44.4	44.0	45.9	41.8	45.7	30.4
	Average.....	49.2	48.3	51.3	47.2	38.5	41.9	35.9
3.....	A.....	63.3	56.1	56.1	54.7	37.8	37.8	45.2
	B.....	54.3	61.9	56.7	57.4	42.7	40.9	41.7
	C.....	61.0	52.1	60.8	62.1	45.7	46.0	39.6
	Average.....	59.5	57.0	57.9	58.1	44.2	41.6	42.2
Average.....		53.2	52.6	53.2	52.9	40.4	42.6	39.1

¹ Data for each test lot are averages of 2 determinations. For cleaned lint, no significant differences in percentage of

fibers longer than 1 inch were attributed to lint cleaner air wash treatment.



TABLE 21.—Percentage of fibers $\frac{1}{2}$ to 1 inch long in lint before cleaning and in cleaned lint and lint cleaner waste after grid-bar air wash, crop of 1965

Seed cotton cleaning level and replication number	Test lot ¹	Fibers $\frac{1}{2}$ to 1 inch long in lint						
		Before cleaning	After cleaning and air wash treatment of—			In lint cleaner waste col- lected after air wash treat- ment of—		
			No air wash	1,000 c.f.m.	2,000 c.f.m.	No air wash	1,000 c.f.m.	2,000 c.f.m.
Moderate:		Percent	Percent	Percent	Percent	Percent	Percent	Percent
1-----	A-----	35.2	32.2	31.3	32.8	34.7	42.2	35.4
	B-----	36.7	35.0	34.4	33.4	45.8	33.5	39.1
	C-----	30.6	28.3	30.5	27.2	34.4	35.7	40.8
	Average-----	34.2	31.8	32.1	31.1	38.3	37.1	38.4
2-----	A-----	36.2	35.6	36.9	34.6	36.5	42.9	32.7
	B-----	34.9	37.9	35.7	36.0	42.8	34.5	38.4
	C-----	34.7	35.9	35.4	32.3	36.1	36.4	44.0
	Average-----	35.3	36.5	36.0	34.3	38.5	37.9	38.4
3-----	A-----	24.5	28.9	30.0	35.4	39.2	33.2	35.5
	B-----	28.3	30.0	34.2	27.6	36.4	36.4	35.4
	C-----	32.0	34.3	35.1	28.8	34.2	34.1	42.6
	Average-----	28.3	31.1	33.1	30.6	36.6	34.6	37.8
Average-----		32.6	33.1	33.7	32.0	37.8	36.5	38.2
Minimum:								
1-----	A-----	32.1	30.9	33.8	36.3	36.8	30.8	36.6
	B-----	32.8	34.9	35.3	33.1	38.0	34.9	36.1
	C-----	35.8	33.7	34.5	30.3	43.7	35.6	36.5
	Average-----	33.5	33.2	34.5	33.2	39.5	33.8	36.4
2-----	A-----	33.7	33.5	33.1	36.7	36.1	37.2	42.1
	B-----	33.9	34.7	32.1	37.5	35.5	38.0	33.5
	C-----	38.9	38.8	38.7	38.0	39.0	35.2	37.3
	Average-----	35.5	35.6	34.6	37.4	36.9	36.8	37.6
3-----	A-----	26.6		31.0	31.1		35.5	41.0
	B-----	33.2	27.2	29.6	29.9	35.3	40.7	33.9
	C-----	28.7	33.6	28.0	25.8	32.7	36.4	33.3
	Average-----	29.5	30.4	29.5	28.9	34.0	37.5	36.1
Average-----		32.8	33.0	32.9	33.2	36.8	36.0	36.7

¹ Data for each test lot are an average of 2 determinations. For cleaned lint, no significant differences in percentage of

fibers $\frac{1}{2}$ to 1 inch long were attributed to lint cleaner air wash volume.

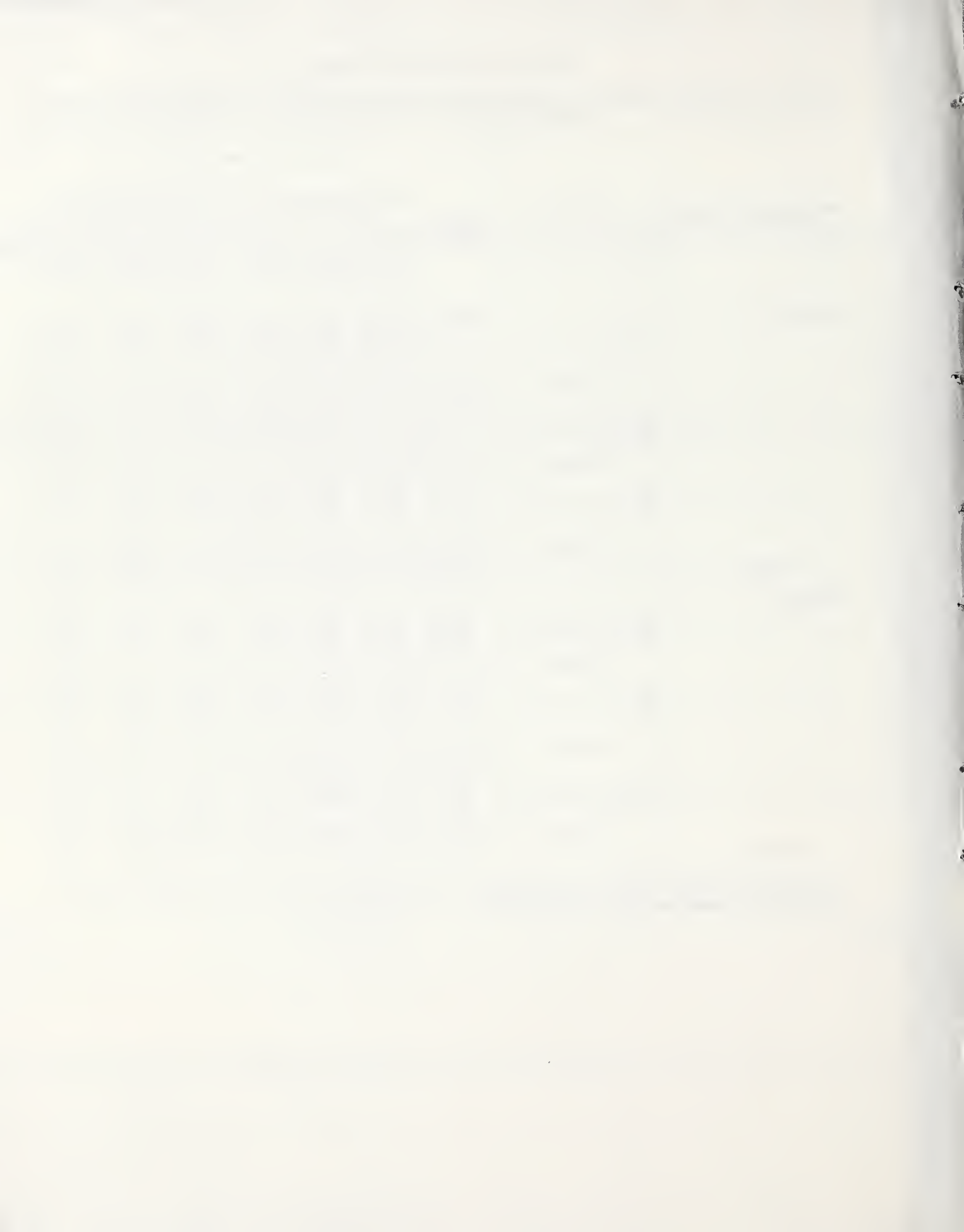


TABLE 22.—Percentage of fibers shorter than ½ inch in lint before cleaning and in cleaned lint and lint cleaner waste after grid-bar air wash, crop of 1965

Seed cotton cleaning level and replication number	Test lot ¹	Fibers shorter than ½ inch in lint						
		Before cleaning	After cleaning and air wash treatment of—			In lint cleaner waste collected after air wash treatment of—		
			No air wash	1,000 c.f.m.	2,000 c.f.m.	No air wash	1,000 c.f.m.	2,000 c.f.m.
Moderate:		Percent	Percent	Percent	Percent	Percent	Percent	Percent
1-----	A-----	15.3	14.3	15.1	16.8	26.0	18.8	35.5
	B-----	18.1	15.0	17.6	15.0	19.2	28.4	34.2
	C-----	13.2	13.0	12.8	12.2	23.0	16.5	18.7
	Average-----	15.5	14.1	15.2	14.7	22.7	21.2	29.5
2-----	A-----	16.0	15.1	18.0	16.0	28.4	26.0	36.8
	B-----	13.8	15.5	13.4	13.7	25.7	29.7	29.8
	C-----	13.4	15.4	14.3	11.6	29.4	29.3	25.5
	Average-----	14.4	15.3	15.2	13.8	27.8	28.3	30.7
3-----	A-----	9.6	11.9	11.6	16.5	25.0	23.7	31.2
	B-----	12.0	14.7	13.8	11.8	19.2	22.9	30.5
	C-----	13.0	13.5	15.6	12.0	16.2	26.1	25.2
	Average-----	11.5	13.4	13.7	13.4	20.1	24.2	29.0
Average-----		13.8	14.3	14.7	14.0	23.5	24.6	29.7
Minimum:								
1-----	A-----	16.9	13.9	16.9	13.3	30.4	19.6	19.3
	B-----	14.2	16.2	13.8	13.9	17.0	30.2	26.4
	C-----	15.8	13.0	14.3	12.9	18.2	16.2	27.5
	Average-----	15.6	14.4	15.0	13.4	21.9	22.0	24.4
2-----	A-----	16.2	15.7	12.7	13.0	28.4	26.7	20.7
	B-----	14.0	15.7	12.2	17.1	26.3	18.1	26.4
	C-----	15.6	16.8	17.3	16.1	19.2	19.1	32.3
	Average-----	15.3	16.1	14.1	15.4	24.6	21.3	26.5
3-----	A-----	10.1	12.9	12.9	14.2	22.0	26.7	13.3
	B-----	12.5	10.9	13.7	12.7	22.0	18.8	24.4
	C-----	10.3	14.3	11.2	12.1	21.6	17.6	27.1
	Average-----	11.0	12.6	12.6	13.0	21.8	21.0	21.8
Average-----		14.0	14.4	13.9	13.9	22.8	21.4	24.2

¹ Data for each experimental test lot are averages of 2 fiber array determinations. For cleaned lint, no significant

differences in percentage of fibers shorter than ½ inch were attributed to lint cleaner air wash treatment.

